



U.S. Department of Energy Office of Industrial Technologies

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Office of Industrial Technologies

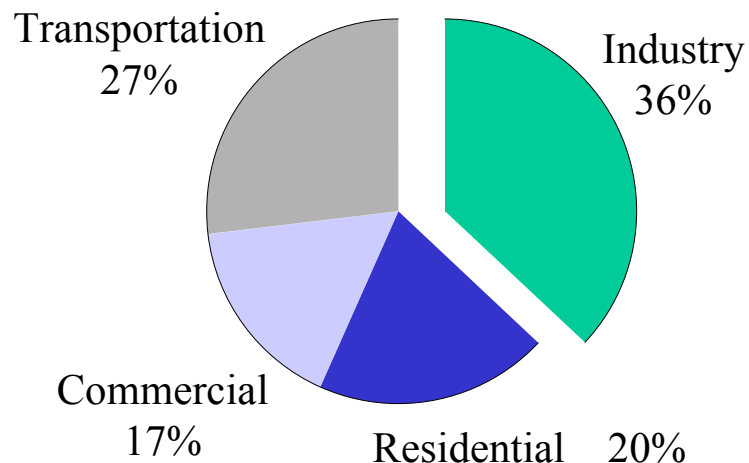
Mission:

Develop and deliver advanced technologies and practices that save energy.

National
Goal

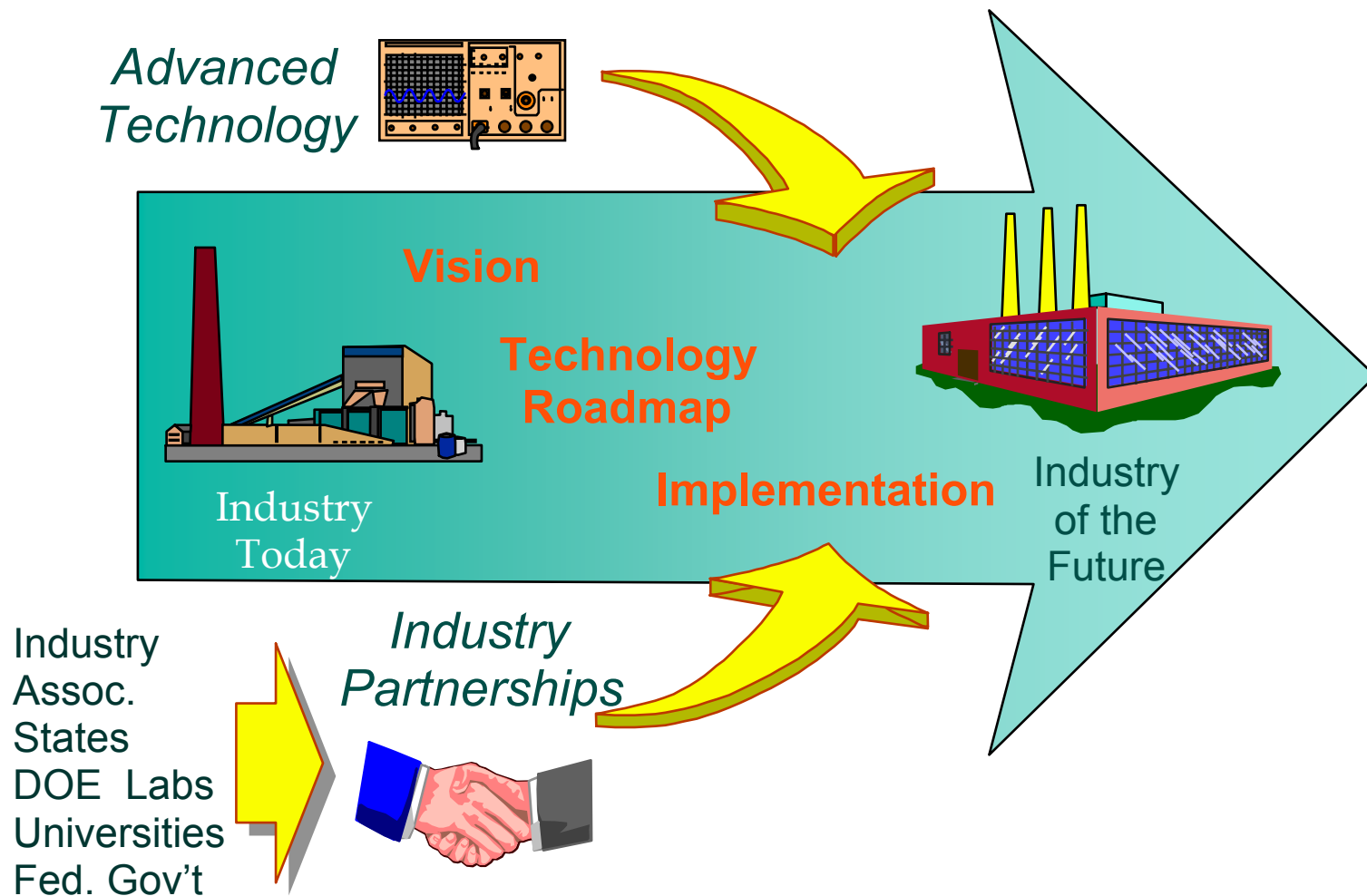
Reduce industrial energy use per unit output by 25% in 2010 compared to 1990.

2000 Energy Use





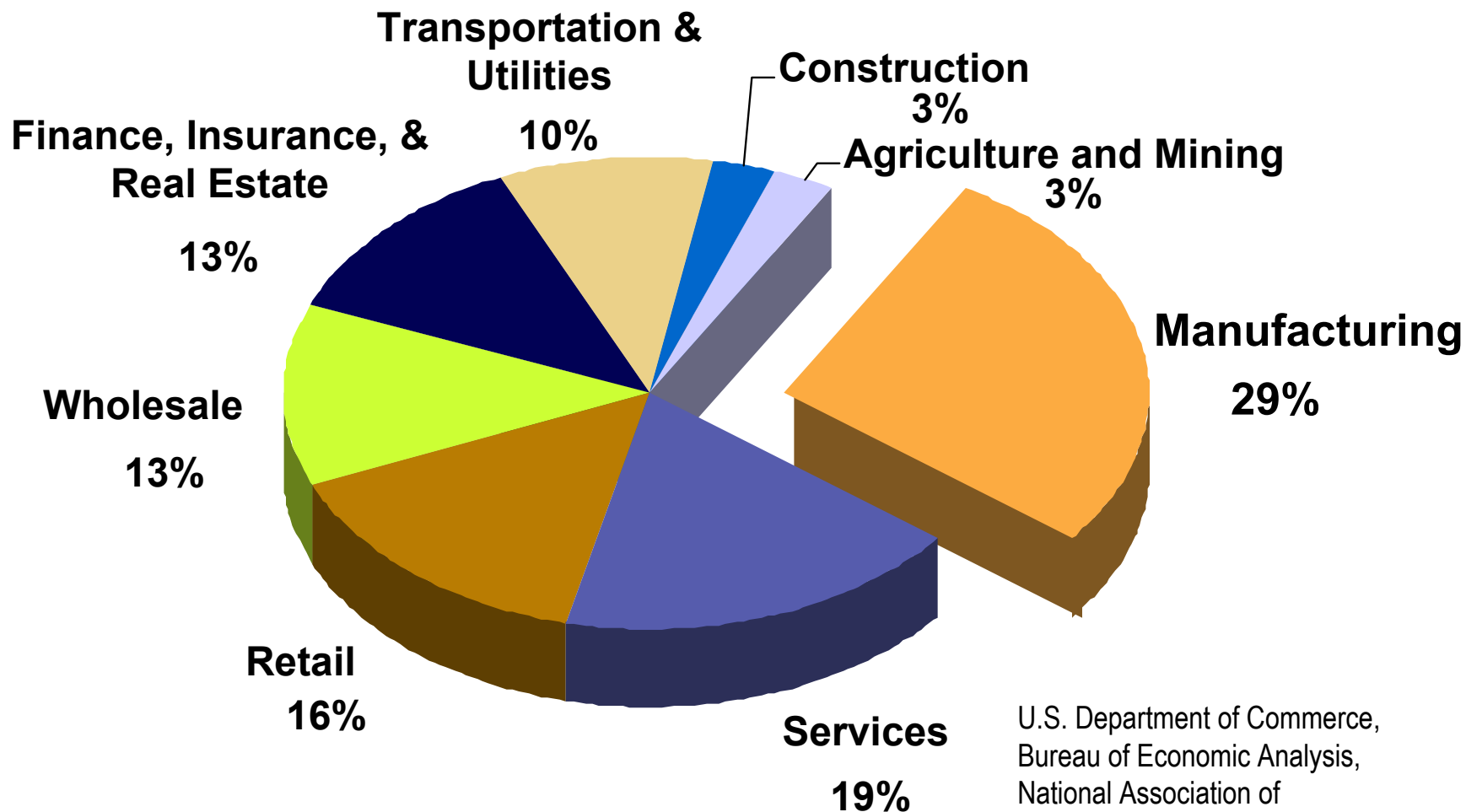
Strategy: Industries of the Future





Contribution to Economic Growth

1992-1997

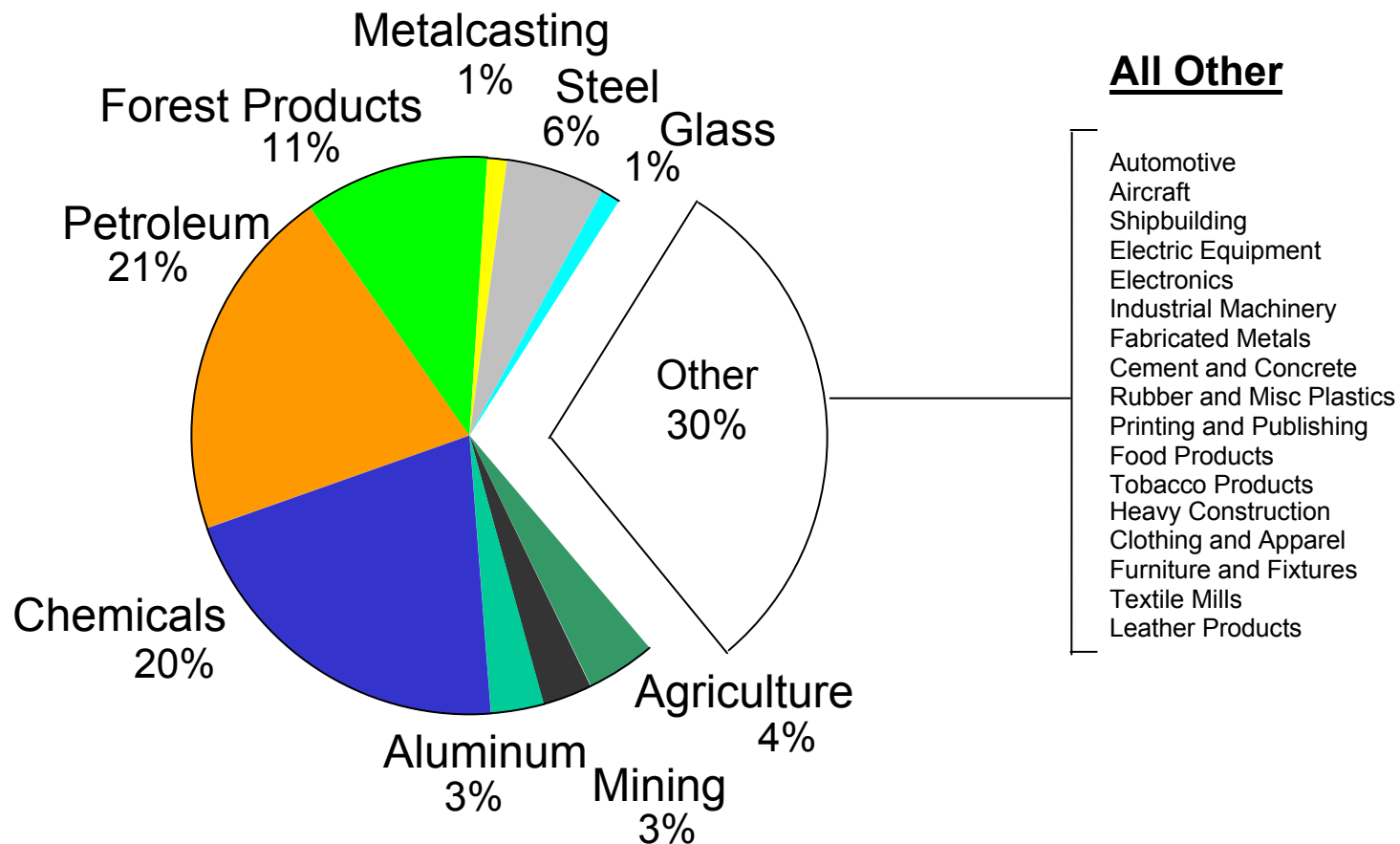


U.S. Department of Commerce,
Bureau of Economic Analysis,
National Association of
Manufacturers, 1992-1997 average.



Focus: Energy-Intensive Industries

Total Industrial Energy Use = 35.9 Quads¹ (1998)

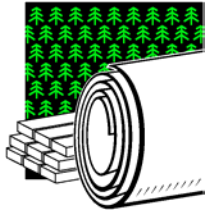


¹Includes 1.9 quads of renewable energy used principally in the forest products industry.



Industry Visions and Goals

Forest Products 11/94



- Recycling↑ 25%
- Over 60% self-generation
- Closed water cycles

Aluminum 3/96



- Energy use↓ 27%
- Greenhouse emissions↑
- Lifecycle usage

Steel 5/95

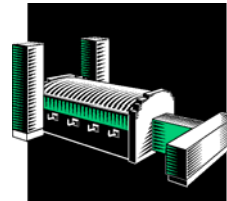


- Zero emissions
- 70% of steel from scrap
- Productivity↑ 15%
- Recycling = 100%
- Energy use↓ 20%

Metalcasting 9/95

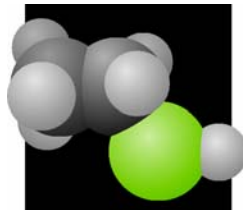


Glass 1/96



- Energy use↓ 50%
- Recycling = 100%
- Emissions↓ 20%

Chemicals 12/96



- ↑ efficiency in use of raw materials
- ↑ efficiency in reuse of recycled materials

Agriculture 2/98



Renewable Bioproducts:
- 10% of industrial chemicals market by 2020

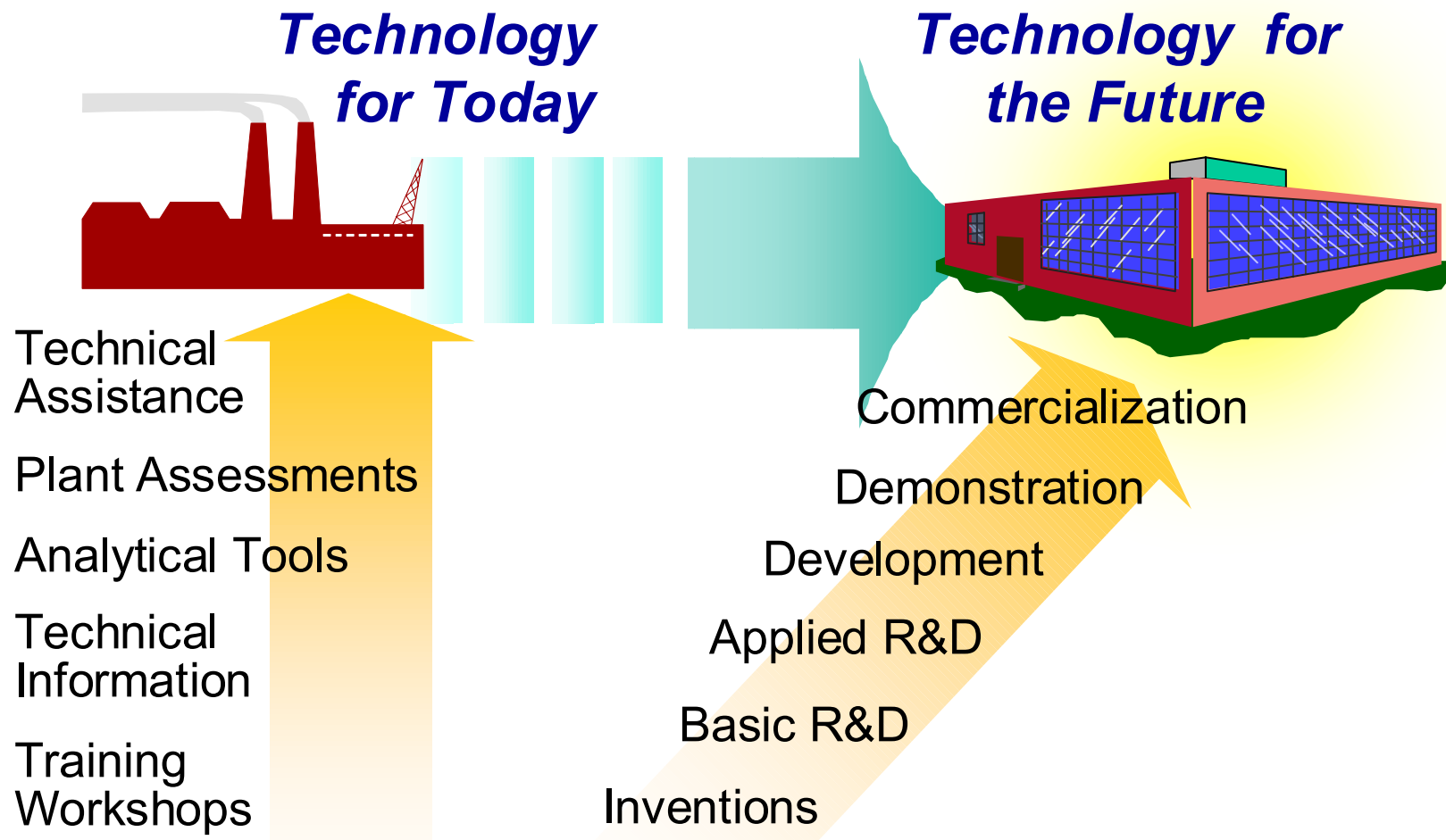
Mining



- Safety and efficiency of mining and processing↑
- Emissions and environmental disruption↓

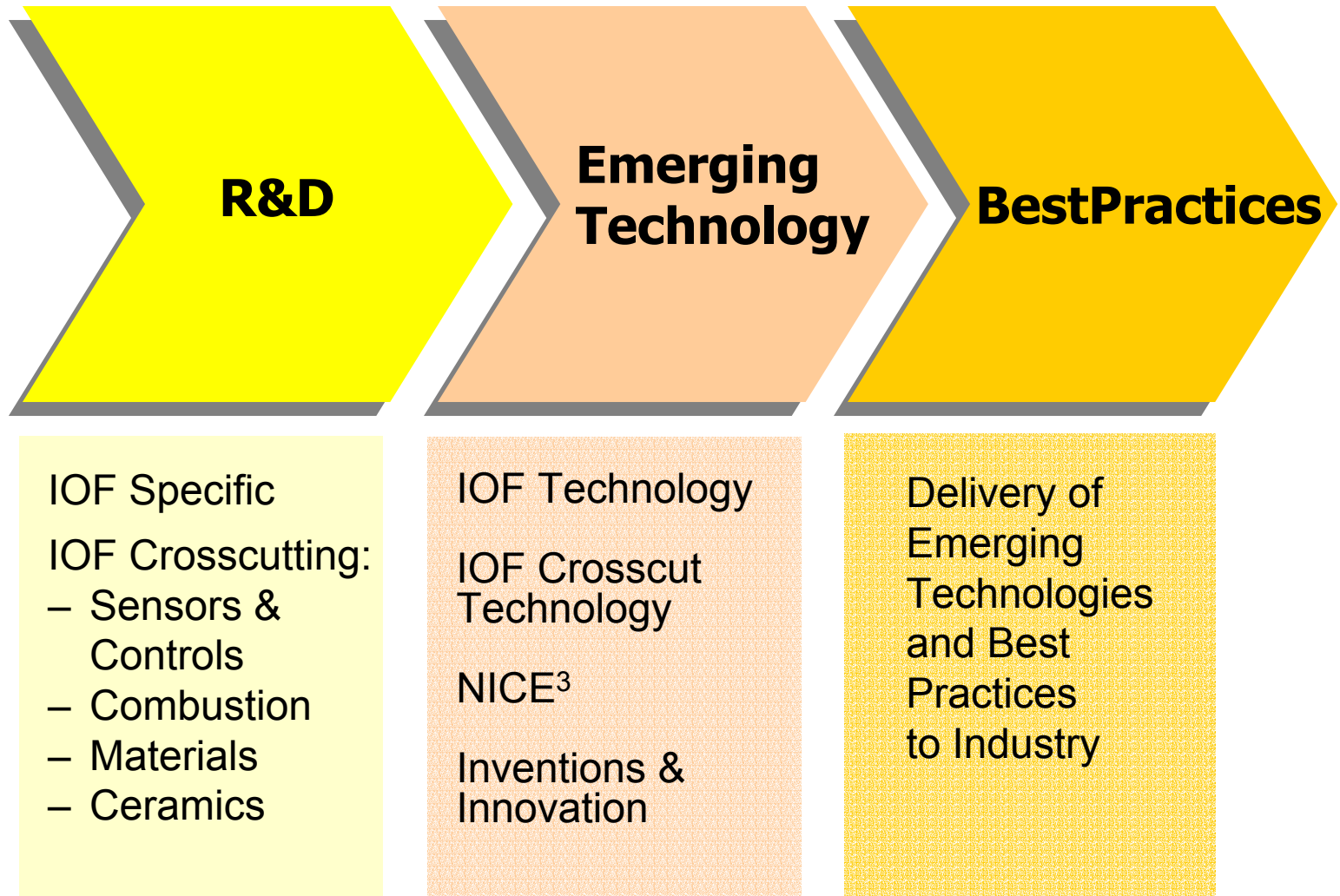


Creating the industries of the future





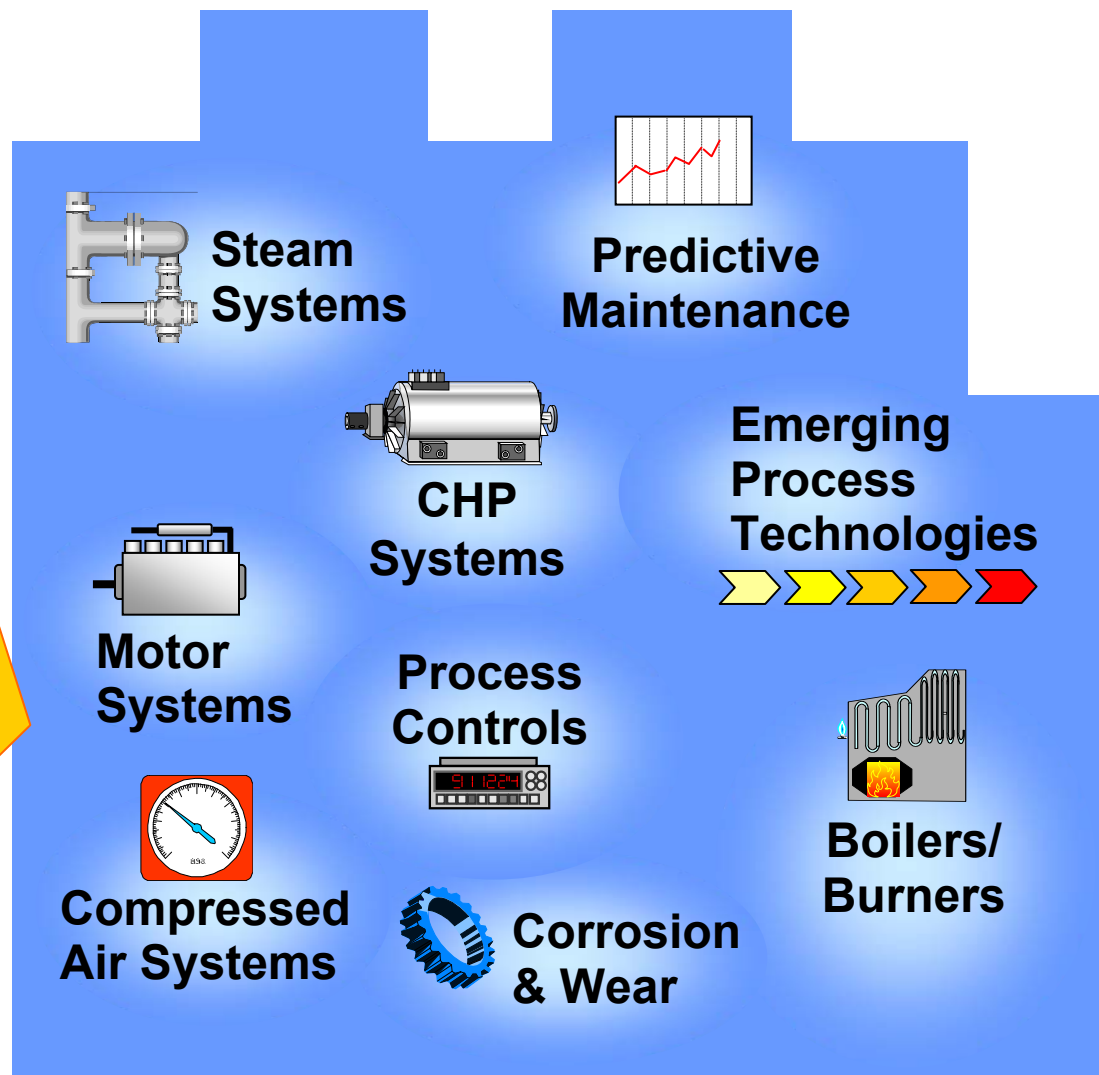
OIT Programs Span Continuum





Energy Technology for Today

Best Practices





BestPractices Program

Provides integrated delivery of energy-saving measures to the nine IOF sectors

Delivers OIT products and services by integrating:

Energy management best practices

- Motors and drives**
- Steam systems**
- Compressed air systems**
- Pump systems**
- Process heating systems**

Emerging technologies

- Verification**
- Implementation**
- Commercialization**

Addresses energy-saving needs and value from a plant-wide perspective by conducting:

Industrial assessments

Showcases



Best Practices Software Tools

Motor Master+ 3.0

- Comprehensive motor management software with 25,000 motors in database
- Repair/replace decision-making
- Self-training CD

Pump System Assessment Tool (PSAT)

- Calculation of energy use and efficiency of pumping system
- Comparisons with optimal system for potential energy and cost savings

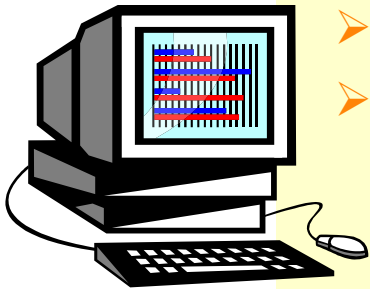
ASD Master

- Screening for Adjustable Speed Drive (ASD) upgrades
- Energy, non-energy, and economic analysis
- ASD specification





Best Practices Software Tools



3E Plus

- Optimization of the insulation of boiler steam lines
- Determination of the most economical thickness of insulation materials under varying operating conditions

AirMaster+

- Compressed air systems assessment and evaluation designed for use with the training program

Integrated Tool Suite

- Under development for plant profiling to identify energy-saving opportunities
- Will integrate the software tools above with OIT information products when fully developed in FY02



Best Practices: Plant-Wide Assessments

Inland Paperboard and Packaging Energy Assessment (forest products)

- Focused on a single paper machine and the fiber plant at Inland linerboard facility
- 23 favorable energy conservation opportunities grouped into 7 projects
- Cost savings of \$9.5 million/year once fully implemented
- Payback period of less than 2 years

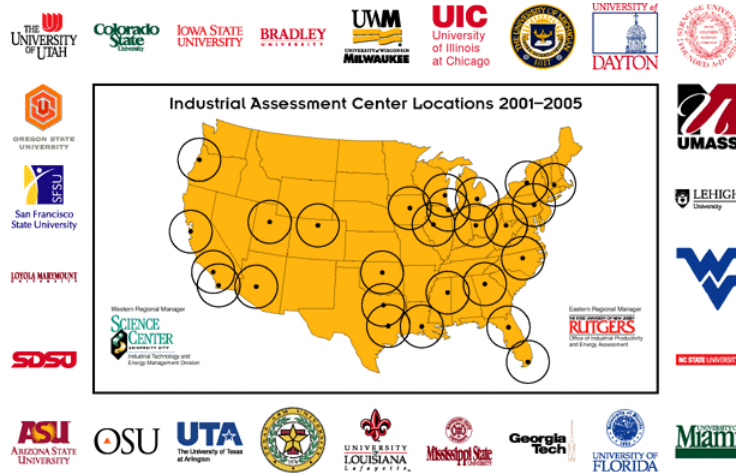


AMCAST Industrial Corporation Energy Assessment (metal casting)

- Focused on 5 areas, which resulted in recommendations for 12 projects at AMCAST's permanent-mold casting facility
- Energy savings potential of \$3.7 million/year
- CO₂ emission reduction potential of 5.5 million tons/year
- Payback period of 3 months



OIT Industrial Assessment Centers



An Infrastructure to Serve You:

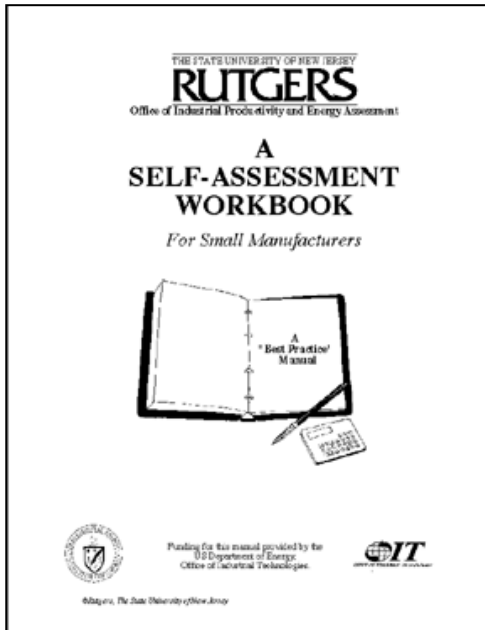
- 26 ABET (Accreditation Board for Engineering and Technology) approved engineering programs nationwide chosen as IACs
- Performed over 10,000 industrial assessments since 1976

Can Help Energy Intensive Facilities Comply with Executive Order #13123:

- Establish energy usage baselines
- Recommend life-cycle cost-effective energy saving measures
- Advise on waste, water, and productivity savings



IAC Self Assessment Workbook



Manual for self evaluation of plant operations and cost reduction:

- Quantify energy and utility costs
- Identify major energy consumers
- Analyze manufacturing processes and subsystems
 - ❑ Boilers
 - ❑ Chillers
 - ❑ Electric Power
 - ❑ Air Compressors
 - ❑ Buildings and Grounds
- Calculate opportunities and savings

<http://www.oit.doe.gov/iac>



FEMP IFP Assessments – FY01

Bureau of Engraving and Printing (Wash., DC)

- Recommendations include over \$700K in annual energy cost savings including demand charges (15% reduction)
- Recommended 46,000 MMBtu in annual energy savings (13% reduction)
- Assessment team: Dayton and W. Virginia IACs, BestPractices Steam, and compressed air consultants
- Implementing 90% of recommendations with in-house funds



USPS Processing and Distribution Center (Atlanta, GA)

- Recommendations include over \$73K in annual energy cost savings (9% reduction)
- Recommended 7,900 MMBtu in annual energy savings (12% reduction)
- Assessment team: Georgia Tech IAC



FEMP ALERT Assessments – FY01



USPS Processing and Distribution Center (San Diego)

- Recommendations include over \$200K in annual energy cost savings (7% reduction)
- Potentially reduces annual electricity consumption 7%, power demand 13%
- Assessment team: San Diego State IAC

NASA Goldstone Deep Space Network

- Recommendations include over \$430K in annual energy cost savings (26% reduction)
- Potentially reduces electrical power demand 100% (3.8 MW peak) with current on-site generation equipment
- Assessment team: San Diego State IAC



Showcases: Delivering an Integrated Portfolio

Alcoa Extrusion Business Units

Salt Lake City, August 27-29, 2001

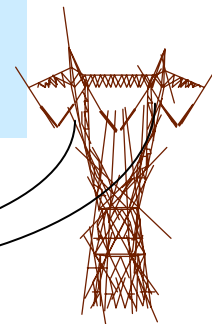
Technical Assistance

Training
20 people
from 12 facilities

Plant-wide Assessments
3 facilities

Pump System Assessment

Compressed Air System Assessment



Process Heating System Assessment

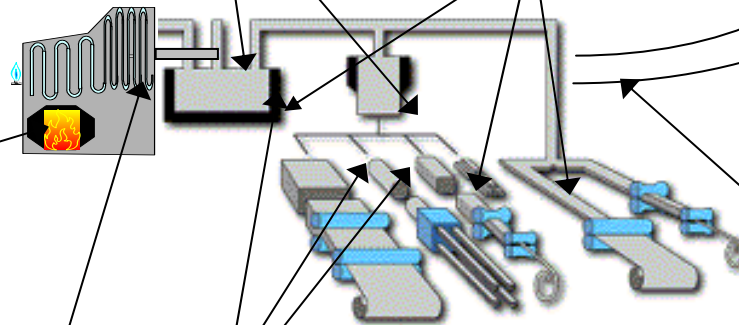
Case Study
Power Factor Correction System

Enabling Technologies

Low-NO_x
Burner

Vision Industries

Vertical
Flotation Melter





Showcase Demonstration

Alcoa North American Extrusions

Showcase

Salt Lake City
August 27-29

Training

20 people from
12 facilities

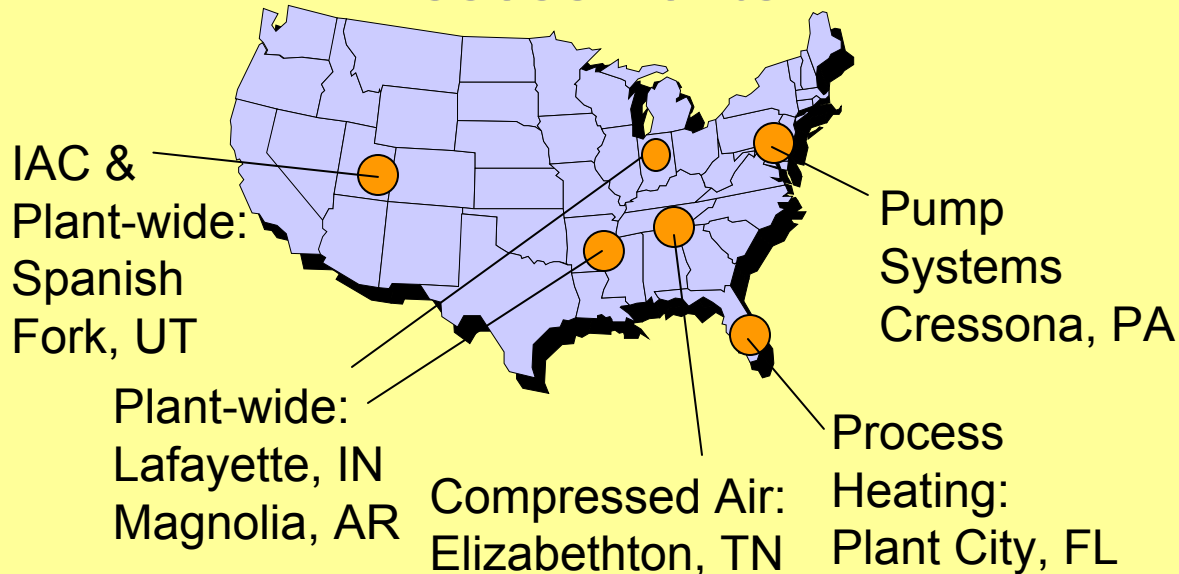
7 Case Studies:

5 Technical:
2 Management

Emerging Technologies:

- Vertical Flotation Melter
- LIBS Sensor

Assessments



IAC Assessment in Spanish Forks

Ten recommendations outlined **\$842,000 in savings opportunities** for an investment of \$393,000.

While still evaluating these measures, Alcoa has expressed interest in additional audits.

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Welcome



The Office of Industrial Technologies works in partnership with U.S. industry to develop and deliver advanced technologies that:

- Increase energy efficiency
- Improve environmental performance
- Boost productivity

If these benefits are of interest to you, take a few minutes to discover the wide range of partnership opportunities available to you and your industry through the Office of Industrial Technologies.



Wisconsin Joins State Industries of the Future Effort.
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